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Mr. Deepak Joshi
Lead Aerospace Engineer (Structures)
National Transportation Safety Board
Room 5235
490 l'Enfant Plaza, S.W.
Washington D.C. 20594

Subject: Comments on NPRM for 49 CFR Part 830

Dear Mr. Joshi:

The Notice of Proposed Rulemaking (NPRM) for 49 CFR Part 830 proposes, in part, that aircraft operators immediately report any incident for which ACAS equipment issues a Resolution Advisory (RA) when the aircraft is operated on an IFR flight plan. This aspect of the NPRM is problematic for two reasons: (1) The rationale given for the proposal appears to involve a partial misunderstanding of ACAS operation, in asserting that its RA's necessarily indicate a breakdown of ATC. (2) More effective means exist for gathering the same information, and these might avoid imposing an undue burden on aircraft operators.

1. ACAS and Separation Standards

The purpose of ACAS is collision avoidance, not the provision of separation. As the senior member of the team that developed the ACAS collision avoidance logic, I can offer assurance that the design of ACAS logic is based upon predicted time to collision, and its warning parameters are decoupled from ATC separation standards. A substantial fraction of ACAS RA's are issued when there is no actual loss of separation. Moreover, some RA's are merely preventive in nature, warning the flight crew against a particular vertical maneuver that could jeopardize vertical separation.

In our study of the operational effects of ACAS collision avoidance logic, *Simulation-Based Assessment of Operational Performance of TCAS II Logic Version 7*, E. Cherniavsky, MTR97W33, it was shown by simulating ACAS operation in US airspace that a substantial number of RA's would occur for encounters that did not violate separation standards, while at the same time, an even larger number of encounters closer than separation standard distances did not generate RA's. (It would not be correct to attribute all of these to operational errors, since visual separation

might have been applicable.) Therefore, it would be inappropriate to conclude that every TCAS RA indicated an event of sufficient significance to investigate.

2. Collection of Incident Data

Various programs are already in place for the reporting of ACAS incidents, although none of these are mandatory or comprehensive. The many years of experience with the FAA's TCAS Transition Program showed that pilot reporting of such incidents is often inadequate to recreate the pertinent details. Flight crews are trained to quickly follow any displayed RA's, rather than to analyze the traffic picture on the cockpit instrument. ACAS displays do not provide the identity of any other air traffic. Since the time, location and details of an RA may be hard for a reporting crew member to precisely reconstruct, such reports would require considerable analysis before the threatening aircraft could be correctly identified and the resulting event severity could be determined.

It would appear that requiring the reporting of all RA's would result in a need to search many "haystacks" of data in the hope of finding a "needle", i.e. an event indicating a safety problem.

Meanwhile, other means are present for identifying problem events. The FAA already collects data for operational error incidents, and these should be more indicative of the type of event that is sought.

If it is still felt that ACAS RA data is desired, please be aware that ACAS avionics already make the RA data automatically available in real-time through the aircraft Mode S transponder. Mode S ground sensors read out this data, although at present it is neither recorded nor shown to the Controller. A recording capability could be added, and together with the sensor's surveillance data, the actual identity and position of nearby ~~aircraft could~~ be reliably collected.

I hope that this information is useful in advancing the safety mission of the Safety Board.

Yours truly,

Andrew D. Zeitlin

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